

information. The head end 500 is discussed in further detail in FIG. 5. The customer premises is configured to communicate with a head end over a wireless link. The customer premises 600 is discussed in further detail in FIG. 6.

The following table describes how the components in FIG. 1 are connected. The first and second columns describe the components and the third column describes the link that connects the components.

	<u>Component</u>	<u>Component</u>	<u>Link</u>
10	National data center 110	Operations network 115	111
	National data center 110	Enterprise network 120	112
	National data center 110	National operations center 200	113
	National data center 110	National operations center 210	114
	National operations center 200	National operations center 210	116
15	National operations center 200	Regional aggregation point 300	117
	National operations center 210	Regional aggregation point 310	118
	Regional aggregation point 300	Internet 145	119
	Regional aggregation point 300	Regional aggregation point 310	121
	Regional aggregation point 310	Internet 145	122
20	Regional aggregation point 300	Market hub 400	123
	Regional aggregation point 300	Head end 510	124
	Regional aggregation point 310	Market hub / Head end 520	126
	Market hub 400	Head end 500	127
	Head end 500	Customer premises 600	128-29
25	Head end 510	Customer premises 610	131-32
	Market hub / Head end 520	Customer premises 620	133-34

The links 111-114 and 117-118 include firewalls (FW) 125, 130, 135, 140, 150, and 155, respectively. A firewall is a system, hardware or software, configured to limit access to a system or network. The links 111-114, 116-119, 121-124, and 126-127 are DS-3 connections. Those skilled in the art will appreciate that the links 111-114, 116-119, 121-124, and 126-127 could be any type of electrical or optical connection including T-1, T-3, OC-3, OC-12, or OC-48 connections. Those skilled in the art will appreciate that the links 111-114, 116-119, 121-124, and/or 126-127 could include redundant connections to increase reliability of the links.

10 The broadband wireless system 100 operates as follows. The customer premises' 600, 610, and 620 communicate with systems within the Internet 145. For instance, the customer premises 600 could download a web page from a server in the Internet 145. To download the web page, the customer premises 600 accesses the server through the head end 500, the market hub 400, and the regional aggregation point 300.

15 The national operations centers 200 and 210 collect network information for the broadband wireless system 100. The national operations center 200 retrieves network information from the regional aggregation point 300, the market hub 400, the head end 500, and the customer premises 600. Network information comprises performance information and fault information. The performance information is information that describes how a communication network is operating, such as throughput rates, number of transmission units, and signal-to-noise ratio. The fault information is information that identifies failures in a communication network, such as alarms and indicators of failed communication devices. The national operations center 200 processes and stores the network information. The national operations center 210 is a mirror system to the national operations center 200. The national operations center 210 retrieves and stores the same network information as the national operations center 200. Thus, if the national operations center 200 fails, then the national operations center 210 takes over without affecting the broadband wireless system 100.

The regional aggregation point 300 routes data through the broadband wireless system 100 and collects network information for the broadband wireless system 100. The regional aggregation point 300 retrieves network information from the market hub 400, the head end 500, and the customer premises 600.

- 5 The regional aggregation point 300 stores the network information and exchanges the network information with the national operations center 200. The regional aggregation point 310 operates similar to the regional aggregation point 300.

The market hub 400 routes data from the head end 500 to the regional
10 aggregation point 300 and vice-versa, and collects network information for the broadband wireless system 100. The market hub 400 retrieves network information from the head end 500 and the customer premises 600. The market hub 400 stores the network information and exchanges the network information with the national operations center 200 and the regional aggregation point 300.

- 15 The head end 500 interfaces the customer premises 600 with other components in the broadband wireless system 100 and routes data from the customer premises 600 to the market hub 400 and vice-versa. The head end 500 collects network information for the broadband wireless system 100. The head end 500 transfers the network information to the market hub 400, the
20 regional aggregation point 300, and/or the national operations center 200. The head end 510 operates similar to the head end 500. The market hub/head end 520 operates similar to the market hub 400 and the head end 500.

- The customer premises 600 exchanges data with the head end 500 over wireless links 128 and 129. The customer premises 600 has two-way wireless
25 communication with the head end 500 because both the downstream and upstream channels are over the wireless links 128 and 129. Those skilled in the art will appreciate that the upstream link 128 could be over a non-wireless link, such as a phone line or a cable modem, which is within the scope of the invention.

- 30 FIG. 2 is a block diagram that illustrates the national operations center 200 in an example of the invention. The national operations center 200 is comprised